Federal Aviation Administration
(FAA)

Office of Innovations and Solutions
(I&S), ACB-1

Project Management Process Guidance (PMPG)

Version: **1.0**

Document Date: **February 1, 2002**

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Background

The Office of Innovations and Solutions (I&S), ACB was established as a core component of ACT with the responsibility to produce two major deliverables: innovations and solutions. The key deliverables under the innovations component are the development of concepts and ideas, and the proof of concepts and ideas. The solutions deliverables are Systems Analysis, Engineering Specifications & Standards, Systems Design, Systems Evaluation & Verification, and System/Product Support.

The reasons the Federal Aviation Administration (FAA) and ACT in particular initiated changes were to: (1) create a "one-stop shopping" for the customer and (2) take advantage of shared priorities. This implies that everyone will be working with a single, integrated plan with the same set of priorities.

A unified plan is expected to increase customer satisfaction through timely delivery of products and services, and make more efficient and effective use of resources. Merged processes are also expected to be adopted for better utilization of all skills and people. The need to increase accountability and responsibility was emphasized in the strategic plan.

Therefore, the I&S will adopt integrated desktop tools as required to meet the objectives to manage priorities, integrated schedules, budget, configuration management (CM), and other program management activities. These integrated tools include the application of project management (PM) principles and techniques and the use of software tools to automate PM practices.

In developing this guidance document, government guidelines and standards including the FAA Acquisition Management System (AMS) and the FAA Integrated Capability Maturity Model (FAA-iCMM) were referenced and adapted as applicable. The international Project Management standard, "A Guide to the Project Management Body of Knowledge (the PMBOK™ Guide)", 2000 edition was also referenced and applied. The PMBOK™ is the international standard for PM practices, and it is a product of the Project Management Institute (PMI) who is the accreditation authority for PM courses in the US.

This document is intended to be used by people who manage projects or support Project Managers in developing schedules and tracking performance within the IES organization. The scope covers and describes PM Processes as required by the IES, ACB PM Policy. It does not describe the general management or administration that is not required to manage projects or programs in details. Project and program will be used in this document as applicable in the PM context rather than as administrative or functional names. All the acronyms used in this document will be spelled out the first time they are used and more than once in some cases. Therefore, there is no acronym list in this current document.

Revisions

Version	Description	Date
Working Draft 1.0	Initial document for review and adoption by Ag. MD .	11/15/2001
Working Draft 1.1	TC SLT's contributions incorporated.	1/9/2002
Version 1.0	Ready for signature	2/1/2002

Endorsements

Signature	Date
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1 Project Management Process Overview

This document describes the standard processes used to manage individual projects within the IESIES corporate structure. **Program Management** as used in this document refers to the application of PM principles to the IES, ACB enterprise projects as an integrated program. **PM** refers to the application of PM principles to managing individual projects to meet the stated requirements. The processes have been streamlined and arranged into sections to conform to the standard five PM process groups.

1.1 Purpose

This document defines the standard processes utilized in all program management activities performed by the Office of Innovations & Solutions (I&S) in accordance with the corporate Program Management Policy. The processes documented here will assist or guide PM practitioners on how to effectively manage and maintain projects. Adopting these processes will make it easier and efficient for all managers to conform to a uniform PM methodology for better information portability.

1.2 Distribution

This document is available to all FAA PM practitioners through the ACT PM web site. Hard copies of the document can be obtained on request from the Program Planning and Review staff (PP&RS).

1.3 Deviations and Waivers

All IES Project Managers and PM Practitioners must adopt the processes defined in this document while executing projects. Deviations from any of these processes are only permitted with the prior written approval of the IES Managing Director, ACB-1. A Project Manager may deviate from any of the processes contained in this document by providing a written justification for the request in the Request for Waiver Form (see annexure 1). The PP&RS will review the requests and make recommendations to the Managing Director on the implications of such requests. The Managing Director either grants or refuses the request and informs the requester of the decision on the same request form.

1.4 Revisions

The latest version of this document is stored on the web server and available on the ACT PM web site. Earlier versions of the document are stored on a network server. The PP&RS will update this document as necessary, and it will be version controlled. Each revision will have a unique version identifier after appropriate approval. The versions will be identified in “1”, “.1”, or “.01” increments, depending on the extent of the changes.

Anyone wishing to request changes, additions, or deletions to this document is required to send a request, using the Process Improvement Suggestion Form (see annexure 2) to the PP&RS. The PPR Manager may approve any requested changes as considered appropriate and notify the requester of the outcome of such request in writing, using the same form. Hyperlinks are displayed in blue before clicking and purple after clicking on the link and they are also underlined. To ensure effective version control, only the PPRS can make changes to this document and update the version as appropriate.

This document contains hyperlinks to other documents on the Intranet and/or on the Internet. It will be reviewed weekly to ensure that these links remain valid and applicable. Furthermore, this document will be peer reviewed as part of the quality control measures using the IES peer review form.

1.5 PM Processes

This document describes the five processes involved with the PM process flow. Each process contains one or more activity. Figure 1 depicts a typical IES PM process flow. This flow chart summarizes the processes from project initiation to project closing. In addition to better program planning and tracking, it will help new practitioners to understand the PM process flow. The numeric labels on the flow chart correspond to the sections in this document.

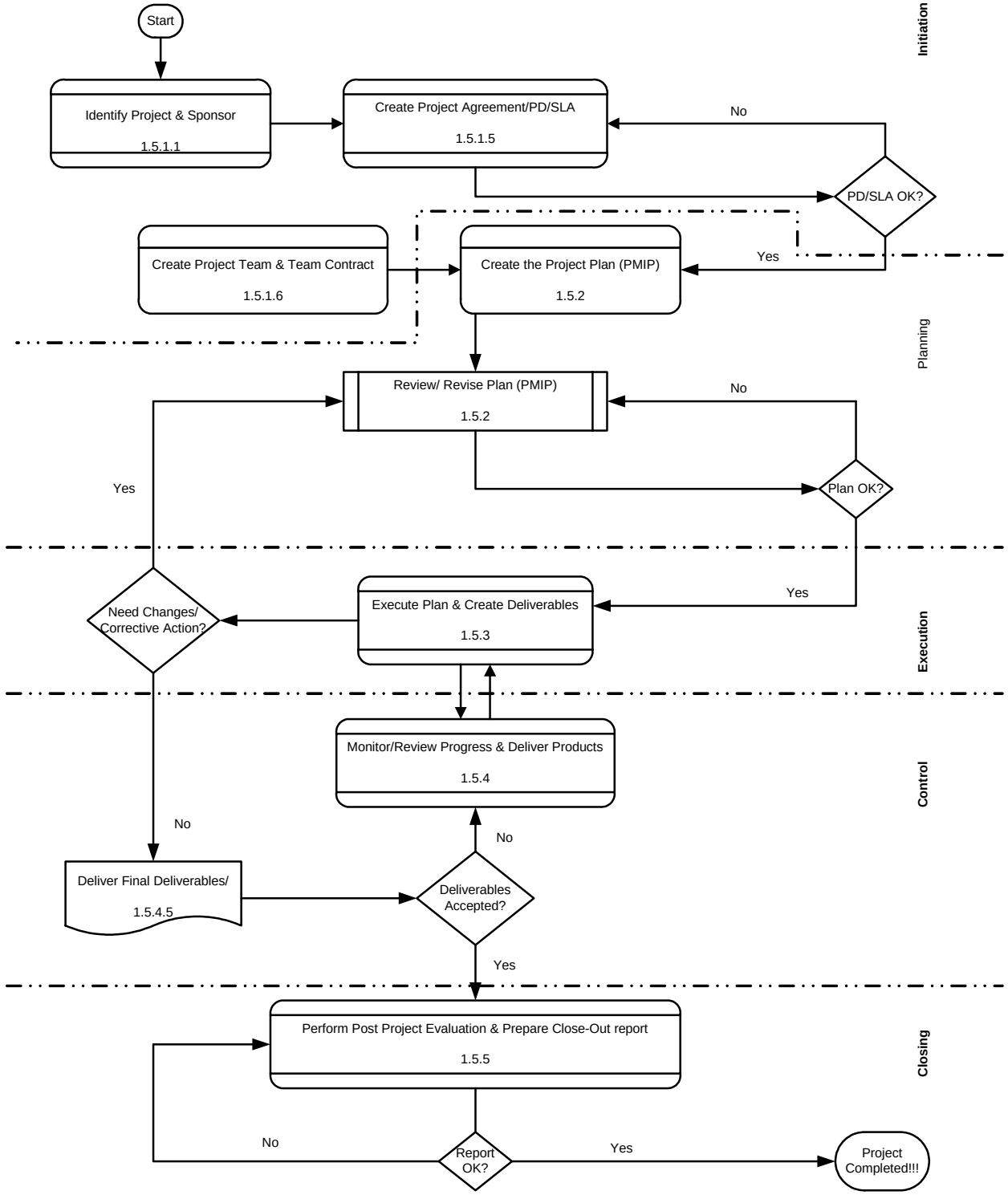

Figure 1: PM Process Overview

1.5.1 Project Initiation

This section describes the activities that are performed prior to the start of a new project. Each activity will be described in sufficient detail in the respective subsections.

1.5.1.1 Identify Project and Sponsor

Project sponsors and customers may request for services to be performed by the Office of IES or the Customer and Program Management Services Staff may canvass for projects work and sponsors. Either way, the workflow is predictable (see work flowchart in figure 2). The project sponsor is responsible for providing resources for the project performance. The Business Development Representative (BDR) and the project sponsor discuss the project goal and the scope of the project. A scope statement describing the high-level activities to be performed, the goal, objectives, and requirements to be satisfied are documented in the final project agreement, Program or Project Directive (PD) depending on the scope, see section 1.5.1.5.

When a project is identified, the BDR informs the IES Manager and then conducts an initial review to determine the requirements in relation to the Technical Center's (TC) strategic direction. If the objectives of the project align with the strategic direction of the TC, the BDR will coordinate with the appropriate Domain Manager (DM) to discuss the customer's requirements.

Otherwise, the request will be referred to the IES Managing Director who will present the request to the Center's Strategic Leadership Team (SLT) for further review. If the SLT decides that the project will support the strategic direction of the TC, the project will be approved for processing. The BDR will proceed as described in the forgoing paragraph.

If a requested project meets all the strategic requirements for implementation, the BDR coordinates with the appropriate DM to determine the detailed customer requirements and the resources needed to do the work. Resource estimates must include personnel, funding, facilities, management, and other support tools that will be used for the project. At the end of this process, the DM coordinates with the PP&RS and the Office of Operations, Technology & Acquisition, ACX provider to determine if appropriate resources are available to accomplish the work within the requested time limit.

A customer or sponsor may coordinate directly with the Project Manager, Solution Manager (SM), or DM if the project request is an extension to the existing project. All subsequent activities hereafter described must be performed accordingly.

If the required resources are available, the DM will coordinate with the PPR&S to develop a scope statement. The scope statement describes the proposed approach to solve the problem, project objectives, work packages, high-level schedule, and resource requirements. The PPR&S will then incorporate the proposed project into the IES project plan and the project

database in pending approval status. Every new project is put the "pending approval" status in the project database until it is presented to the IES management (LT) for initial approval. The PPR&S present proposed projects for final approval at the IES annual Program Management planning meetings.

Upon initial approval, the SM coordinates with the DM to further refine the customer requirements and describe the work in greater detail. At this point, informal agreements are established with the SM to acquire the resources to perform the work. Cost estimates for all the services of the appropriate solution teams are solidified. A Project Manager is identified by the IESLT, and a list of required resources is compiled. Finally, the PPR&S present the proposed project to the I&S leadership team (I&SLT) for consideration and approval.

1.5.1.2 Project Prioritization

Projects are prioritized by the IESLT with the active participation of the PPR&S that has the primary responsibility to maintain a project database. The prioritization of projects is based on criteria described in the project prioritization guidance. Amongst them are the time of request, strategic need of the project, and its relationship to the IES strategic direction. Projects with "exceptional priority request" are expedited using the project prioritization exception process in section 1.5.1.3.

1.5.1.3 Project Prioritization Exception

A project manager may embark on a project requested under exceptional project prioritization regardless of the planned priority as long as such a project does not negatively impact the existing project schedule or cost. If the project will delay the target delivery date of the prioritized projects, the PM must refer it to the IESLT for review and appropriate decision. The project must also be referred to the IESLT for possible reprioritization if additional resources and cost are required to implement the project. Either way, the project must be registered with the PPR&S in order to be listed in the project database.

1.5.1.4 Appoint the Project Manager

Although the Project Manager is identified in section 1.5.1.1, the appointment and assignment is made in this section. The Managing Director, ACB-1 appoints one person, with the required knowledge, experience, skills, and behaviors to be the Project Manager. This appointment must comply with FAA personnel recruitment policies and procedures.

The Project Manager is responsible and accountable for ensuring the success of the project by providing effective leadership, effective communications, and identifying and resolving project problems in a timely manner.

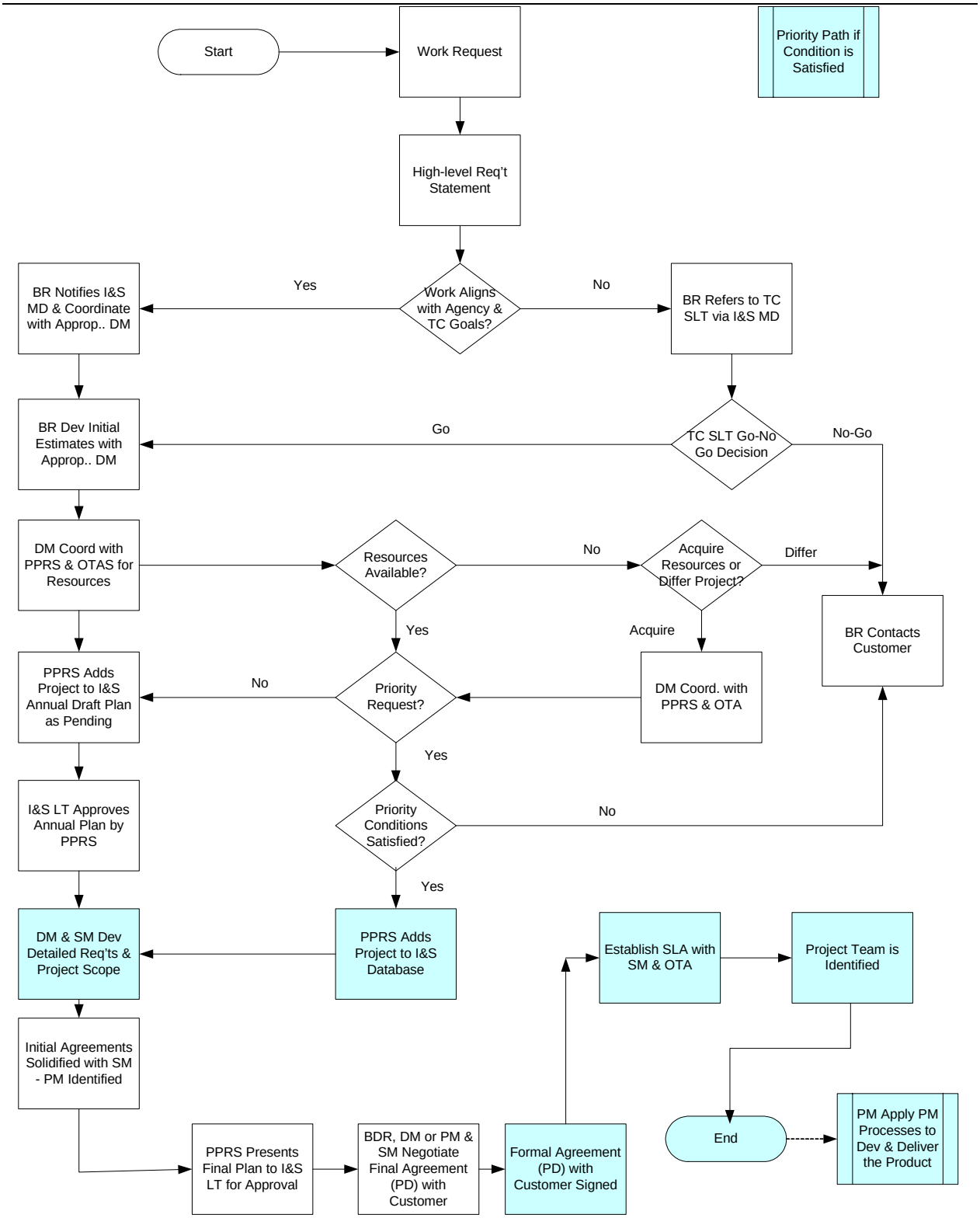

Figure 2: Innovations & Solutions Work Flow Process

1.5.1.5 Define Project Agreement/Program Directive(PD)

After a project and the sponsor have been identified, another phase in the project initiation process begins. This phase focuses on solidifying agreements between all stakeholders, sponsors, and IES Management or representative. The scope, goals, funding, schedule, resources, and initial requirements of the project are defined and agreed upon by all key stakeholders at a project initiation meeting. A decision is also made to begin work on the project or project phase at this meeting. Minutes of the project initiation meeting are taken, and action items are recorded and tracked.

Once the project request has been approved, the BDR, DM, or Project Manager meets with the customer to discuss and finalize the draft agreement. If the requirements in the draft agreement are acceptable to both parties, the appropriate corporate representatives will sign a formal agreement (i.e. Program Directive (PD)); see annex 3 for a PD template. The PD will include a scope statement that forms a common understanding of the project objectives and requirements by all parties. Also, internal formal agreements are established with the SM and ACX providers for the required services.

Typical deliverables produced by this phase include the PD, meeting minutes from project initiation meeting, and action items tracked.

1.5.1.6 Team Development

After a project has been approved to be implemented and the PD has been delivered, the DM, SM, and the Project Manager will meet to select the project team. Once the team has been selected, the Project Manager will conduct a kickoff meeting to brief the project team. Relevant training and coaching sections including instruction on how to use IES PM methodologies are conducted. The PPRS will provide PM process coaching to teams as needed.

Apart from the process training, the Project Manager conducts a skill gap analysis to determine the most appropriate training or other developmental initiatives needed to assure that the project team is effective in meeting the sponsor's goals. The ARA Intellectual Capital Investment Plan is used as the basis for the analysis and determination of training needs of project team members. To ensure that PM software tools are effectively used, appropriate training will be provided to all relevant project managers and personnel.

At this point, the project manager will begin developing a project plan with the active participation of team members using the project management implementation plan (PMIP) template, see annex 4. The plan must include a responsibility matrix to identify individual team members that have made commitments to the activities described in the PD and translated into a planned implementation approach.

In this phase, the project team commits to performing the activities required to successfully complete the project by accepting responsibilities for individual activities and work packages described in the plan. The team's active participation in developing the project plan forms a verbal commitment to meet the project objectives. The project team confirms their commitment to the project objectives by endorsing a project team commitment form or by signing the PMIP.

1.5.1.7 Communicate Project Initiation

The last step in the project initiation process is to communicate the project agreements or PD and the appointment of a Project Manager to the project team and all affected organizations. This communication could be in the form of a memo or an electronic mail from the IES Managing Director, ACB-1 to the IESLT and other stakeholders.

1.5.2 Project Planning

After it has been decided that work will begin on the project with the announcement at the end of initiation process, the detailed planning to perform the work begins. In this phase, the project scope expressed as a statement in the initiation phase is fully defined, activities are identified, and a schedule is developed. The primary product of this phase is the project plan, tagged the PMIP. The Project Manager must prepare the PMIP as a PM tool irrespective of the project type.

The PMIP defines the technical and managerial processes necessary to successful complete a project. The plan also identifies goals and success criteria or metrics to track the efficiency and effectiveness of the technique used for implementing the project. A template for developing a PMIP is provided by the PPRS (annexure 4). Since the project initiation phase involves a lot of planning activities, many documents from that phase are contained in the PMIP. Planning processes go through a series of iterations until an acceptable plan is produced.

1.5.2.1.1 Review and Understand the Process Inputs

As described in the foregoing sections, the original product or service description and PD were developed before the project team was formed. Therefore, the Project Manager must review all relevant documents with the project team members. This process includes the following activities:

- Review the product description, PD, constraints, and assumptions to help the team achieve a common understanding of the project objectives.
- Identify and resolve any conflicts, inconsistencies, and ambiguities among these documents and inform the project sponsor of any problems with documents and seek clarification.
- Update documents to reflect agreed upon changes.

1.5.2.2 Define Project Scope

The scope statement typically summarizes the project team's understanding of the justification for the project, the project objectives, major outputs, and deliverables. As the project progresses and more is learned, the original scope statement may need to be revised to reflect needed changes. The scope statement must include a statement of project justification that explains the overall business need for the project as well as its importance and priority. The Project Manager needs this information when negotiating for resources, time, and other tradeoffs.

In this phase, the project team defines all the work that is required, and only the work required, to complete the project successfully. This involves organizing the project into major work elements or deliverables. The resulting products are the Work Breakdown Structure (WBS) and any supporting documents that describe the project's product or service (e.g. program plan).

The WBS elements are decomposed until the deliverables are defined in sufficient detail to support future planning activities. Each item must be individually scheduled, budgeted, and assigned to a specific owner who will accept responsibility for its satisfactory completion. All projects are decomposed to the level where accurate cost and duration estimates can be made by the project team. A high-level resource and cost estimates are developed during the project scope phase. The Standard FAA WBS will be used as the basis for all projects as applicable.

Once the scope statement and scope definition is complete, the project team must review it to ensure that there are no misunderstandings before proceeding to work. Validating the project scope requires the Project Manager and the project team to make any changes as required to the project scope statement and get it signed by the project sponsor.

1.5.2.3 Create a Scope Management Plan

The more numerous the changes to the project scope, the greater their significance, and the later they are introduced, the longer the project will take to complete. Therefore, in order to control "requirements volatility", the number and significance, and the timing of changes to the project scope after work has begun, a change management plan must be developed as part of the PMIP.

To minimize schedule delays and late product delivery, project managers are required by this process to carefully consider and controls changes to project scope within the limits of their authority. The PMIP must define who is authorized to make changes to project scope and how such decisions are made and communicated to all stakeholders.

The Project Manager and the project team define the different types of changes that are likely to be requested during the project implementation. Such changes may include the addition or deletion of features, increases or decreases in the number of sites, or people served, or changes to the product definition that could significantly impact the schedule. The team must identify who

must be involved in making the various types of scope changes and how such changes will be authorized and communicated.

The team must perform a risk analysis and define categories to assess what impact such changes could have on the project scope, such as:

- *Low impact* -- can be made without impacting other scope elements or project parameters (i.e. schedule, cost, quality),

- *Medium impact* -- will require minor acceptable tradeoffs with other scope elements but not other project parameters, and

- *High impact* -- will significantly impact other scope elements or project parameters;

1.5.2.4 Define Project Activities

Activity definition involves identifying and documenting the specific activities that must be performed to produce the deliverables or sub-deliverables identified in the WBS. Each WBS element is broken down to action level items, as opposed to work packages.

Activity lists from previous projects may be reused as a baseline definition for new projects. The activity list must include all the work elements that need to be performed to achieve the project objectives. The list should be organized as an extension to the WBS to ensure an accurate coverage of the project scope. Each activity must be described clearly to ensure that project team members understand how the work is to be accomplished.

Assumptions and constraints must be documented to facilitate the use of the list by other PM processes. Supporting details may be documented within a project schedule where the PM software tool has the capability for notes, documentation, or links.

1.5.2.5 Develop the Project Schedule

The input to project schedule is the output from activity definition. Schedule development is an iterative process involving other processes that provide inputs to the process, especially resource estimates, task durations, and project costs. The IES PM policy requires all Project Managers to develop individual project schedules that can be consolidated into a fully integrated IES program schedule by adopting this process.

Primavera Project Planner for Enterprise (P3e) will be used to manage corporate IES program schedules. MS Project will be used to transition project schedules from customers who do not have access to the corporate IES PM software tool while developing the high-level schedule at project initiation.

1.5.2.5.1 Estimating methods

The method(s) used for estimating depends on the nature of the project and must be documented in the PMIP. However, project teams should adopt one or more of the methods listed below while estimating activity duration, resources, and cost needed to complete a project:

- Expert judgment guided by historical information is applied in estimating resource levels, resource productivity, activity duration, cost, and other project items.

- Simulation involves using methods like Monte Carlo to calculate a distribution of probable results of schedule, resource, or cost defined for each activity for the total project life.

- Delphi technique involves extracting the knowledge of a group; each individual group member makes their best guess, outer quartiles explain their guess. Repeat 1-3 times and the average at the third pass is used as the valid estimate.

- Analogous estimating also known as top-down estimating involves using the actual data from a previous, similar project in the current project.

- The statistical or three-point technique is calculated as the optimistic estimate plus 4 times most likely plus pessimistic divided by 6.

1.5.2.5.2 Scheduling Steps

The following steps are required to complete a schedule:

1. Developing a project schedule starts by organizing the project activities in a logical order (network logic) to form a project network. Activity sequencing must be accurate to support a realistic and achievable schedule. This process may lead to the discovery of missing work packages or deliverables that need to be described in further detail for clarity. Any updates resulting from this process must be reflected in the WBS and other related documents.

2. The output from activity sequencing is the project network diagram and an updated list of activities. Once established, the project network may be used as a template for similar projects in the future with some modifications.

3. The next step is to estimate and assign the duration for each activity identified in the list. This process involves estimating the number of work periods that would be needed to complete each identified activity. Therefore, an expert or individual with experience in the nature of the specific activity must be involved in assigning durations to project activities. The actual duration for similar activities in previous projects may be used as a basis for estimating current activities durations. Elapsed time periods should be listed as a separate activity. For example, if it takes 3 days to obtain approval to install a system after delivery, list "approval" as an individual activity, instead of a lead or lag, to reduce

ambiguities in the schedule. The accuracy of the overall project duration and effectiveness of the schedule are highly interdependent.

4. After estimating the schedule, the PM must determine what resources are required to perform the project work, as identified in the high-level estimate during project initiation. The project plan must contain a description of the types of resources that are required, and in what quantities, for each WBS element. The resources required to execute the project could be FAA government or contract employees. The quantity of resources needed to accomplish each work package or activity must be estimated using the method described in subsection 1.5.2.5.1, estimating methods. The Project Manager determines the amount of details and the level of specificity in the resource pool.

5. The next step is defining the project and resource calendars. Project calendars affect all resources within the project (e.g., normal FAA workdays, and public holidays) life cycle. Project calendars also define the type of work schedule that will be applicable to a project such as normal FAA 5-day workweek, 3-shift day, or 7-day week. Resource calendars identify work periods for specific resources or resource categories (e.g., unavailability of resources on training, vacation, regular day-off, etc).

6. All projects have some form of constraints and assumptions that must be identified and tracked to successfully meet the customer's needs. Consequently, there are two major categories of constraints that must be considered while developing a project schedule:

    a. Imposed dates (mandatory) - is used to restrict the start or finish dates of activities due to unique situations or delivery of materials from other parties that are not part of the project and

    b. Key events or milestones - require delivery of products by specific dates and these dates may only change with the authorization of the project sponsor. A project sponsor, customer, or other external factor may set these dates.

    Assumptions made during a project schedule development must be documented in the project plan or within the schedule. Assumptions are factors that are considered real, true, or certain and they generally involve a degree of risk.

7. Leads and lags between project activities may be used in schedule development as needed. Lead-time is an overlap between tasks that have a dependency. For example, if a task can start when its predecessor is half finished, you can specify a finish-to-start relationship with a lead-time of 50% for the successor task. Lag time is a delay between tasks that have a dependency. For example, if you need a 2-day delay between the finish of one task and the start of another, you can establish a finish-to-start relationship and specify a two-day lag time. This is not advisable because it could create problems in schedule maintenance. Instead, create an activity with 2 days duration to represent the 2 days delay.

8. Perform a schedule risk analysis by calculating the early and late start and finish dates for all activities without regard to any resource pool limitation. The analysis of this schedule will indicate the time periods within which the activities should be scheduled given resource limits and other known constraints. Review various schedule alternatives, considering the critical path method (CPM), using duration compression methods where necessary, until a desirable result is achieved. This output is the preliminary schedule. One or more software tools may be used to evaluate various schedule alternatives before selecting the most viable one. The approval of this version of the schedule forms the baseline.

9. Management and technical project schedules will be developed and maintained for all projects. The high-level management schedule will be developed with major milestones and deliverables to provide the IES Manager with management information at the enterprise level. This will be an integrated schedule incorporating all projects. The more detailed technical schedules will be developed and maintained by each project team as part of the integrated schedule. Upper management will view a rolled-up version of the detailed schedule, while the tactical managers may view the detailed or rolled-up schedule as needed. Upper management may also drill down the rolled-up schedules in exceptional cases.

1.5.3 Project Execution/Implementation

Project implementation proceeds by performing the activities described in the PMIP. During this process, the project is monitored and controlled to ensure that the project meets it set targets. Project performance must be measured regularly so that corrective actions can be taken when variances occur to keep the project in control. The Project Manager is responsible for ensuring that the schedule is updated, status reports are produced, program reviews are attended, quality products/services are delivered, and standard configuration management practices are complied with.

1.5.3.1 Authorization to Initiate Project Activities

This step represents the critical transition from planning to performance. Many assumptions about resource availability were made during the project planning phase. These assumptions must now be made to happen. The SM is responsible for ensuring that all required resources are freed up from other responsibilities to enable them perform their project activities as scheduled.

The Project Manager is responsible for ensuring that team members are provided with the needed resources to do their work and that they coordinate their work effectively as a team. The Project Manager formally communicates the start of project execution to team members, functional managers, and key project stakeholders after all the needed resources have been provided. The PM must works individually with team members to ensure that they understand the schedule and their immediate responsibilities.

1.5.3.2 Perform Project Activities

It is each project team member's responsibility to perform their activities to fulfill their roles as planned. Each team member has a responsibility to coordinate closely with other team members on interdependent activities. When team members feel they cannot overcome certain obstacles by themselves, they must seek assistance from the Project Manager immediately. The Project Manager may also solicit the assistance of the SM or DM to resolve any conflicts that are beyond his/her control. Team members have a responsibility to review and understand the project schedule and subsequently:

- Develop an individual performance plan,
- Resist any temptation to delay scheduled work with the hope of making it up later,
- Work proactively with others who are responsible for completing work upon which the team member is dependents, and
- Inform the Project Manager of any problems that might inhibit the timely completion of scheduled project activities and suggest alternative courses of action.

1.5.3.3 Perform Quality Assurance Management

The purpose of quality assurance is to address the quality of the process being used to implement the project such as systems testing. Project team members are required to adhere to the PM Process Guidance throughout the project life cycle. Each project must describe the quality assurance plan for the product in the PMIP in conformity with the IES Quality Assurance policy.

PM quality audits will be performed by the PPR&S quarterly or at the request of project managers or the Managing Director, ACB-1. Initial audits will be performed at the beginning of each project (planning phase). Nonconformities and recommendations will be tracked to ensure that projects deliver quality products and/or services. The second and third audits will be performed at 3-month intervals unless a request for audit is made before the 3-month intervals. The last audit will be done at project closing which will be part of the project closeout phase.

Key aspects of the processes required to develop a high quality product will be measured against established standards using an audit checklist (see annexure 5) and reported using the audit form (see annexure 6). An audit report prepared after the data analysis describes the nonconformities and provides recommended corrective actions to be taken by the project team.

Unresolved non-conformance issues must be brought to the attention of the IES Managing Director. Both interim and final audit reports are delivered to the Project Manager and the Managing Director at the end of each audit. The final audit reports must be accepted and signed by the IES Managing Director and the requesting manager before archiving. The audit team

must track the implementation of all recommended corrective actions through follow-up audits until the process has been fully complied with. Follow-up audits are not intended to and do not count as regular scheduled audits. Typically, the PM audit process involves the following steps:

1) Audit scheduled by PPRS or audit is requested by the Managing Director or Project Manager,

2) PPRS schedules a meeting with the Project Manager and team,

3) PPRS requests relevant documents,

4) PPRS reviews requested documents, and record issues in the checklist and the audit form,

5) PPRS discuss deviations/non-conformity issues with Project Manager and team,

6) PPRS prepares an audit report with recommendations,

7) PPRS delivers the audit report to the Project Manager and the Managing Director,

8) PPRS Schedules a meeting with the Project Manager and the Managing Director to resolve any outstanding issues if any,

9) PMST Submit final report to Project Manager/Managing Director

10) IES Manager accepts and signs the report

11) PPRS archives the report and

12) PPRS tracks the implementation of recommended corrective action

1.5.4 Project Control

The IES leadership team will adopt the balanced scorecard approach to management. Therefore, performance measurements will focus on customer satisfaction, internal business processes, financial results, and learning and growth. Project Managers are required to oversee the project work and to ensure that team members complete their work as planned to meet customer's requirements. This section describes effective methods for monitoring and controlling project resources.

1.5.4.1 Project Monitoring Tools

This subsection discusses meetings and software tools that are used for effective and efficient tracking and managing projects.

1.5.4.1.1 Review Meetings

Technical and management review meetings are integral parts of PM. Technical meetings, such as System Test Review Board (STRB) meetings, are conducted weekly to review project status, update schedules, and discuss any issues that may be keeping the project from progressing. IES program management meetings are held weekly to discuss a wide variety of program management issues, including program status, business direction, resource management, and prospects of new projects (see annexure 7 for agenda template).

Minutes are taken at these meetings (see annexure 8 for minutes template) and distributed to all participants with action items assigned (see annexure 9 for action item template). Previously assigned action items are tracked to ensure that all participants follow-up on assigned responsibilities.

Review meetings are held monthly and quarterly to brief management on project status and discuss management issues affecting the projects. This provides management with current project status information and steps needed to keep the project on track.

Monthly program review meetings are held to provide project managers the opportunity to brief the IESLT on the status of their projects and to raise issues that need management's attention. A program review report containing status, schedule, and cost data in comparison to the plan is presented to IES leadership team (IES LT) at the meeting. Other program review issues include product specifications, effect of any proposed changes on cost and resources, schedule, and equipment or facility capacity. A program review form (see annex 5) is available at the ACT PM web site for use by Project Managers.

A Quarterly program review involving the PPR&S and BDR will be held to review status of current projects, assign actions as needed, review and approve proposed draft and final annual plans, and review the status of the IES balanced scorecard

1.5.4.1.2 Software Tool

The integrated IES program schedule is maintained using Primavera Project Planner for Enterprise (P3e) software tool. Individual project schedule analysts will maintain the detailed project schedules that can be rolled up to the enterprise level for analysis and reporting. P3e will be available and accessible to all project managers with appropriate rights.

The software tool System Administrator will coordinate the installation, maintenance and access control with the Network Administrator using guidelines provided in the PM Software Tools SMT Access Control Process. The document provides details on the process for requesting and obtaining access rights to PM information to prevent unauthorized tampering with the schedules. The P3e System Administrator in consultation with project managers controls access to all projects in the P3e database.

1.5.4.2 Monitor Project Progress and Update Schedule

The enterprise program schedule will be monitored by the PPR&S to ensure that the projects will meet their respective targets on time and within budget. Consequently, all Project Managers will monitor their projects by collecting progress data directly from project personnel on a weekly basis. The enterprise projects coordinator will coordinate schedule updates with the Project Manager and report status to the IES Manager weekly or as needed. The project team should consider all known factors and assumptions before making a decision on the optimum update cycle while developing the PMIP.

The Project Managers and the respective Project Schedule Analysts should identify when work on the respective activities actually started and finished at specified intervals as planned (the update cycle). Team members must provide complete and accurate project status information to the PM or the assigned Schedule Analyst at the weekly status review meetings or outside the meeting. After the status update, the project manager should analyze the schedule to identify areas that need corrective actions.

All current schedules must be compared against the established schedule and cost data to the baseline unless where rebaselining have been approved by the appropriate authority. This involves the review and analysis of the critical path status and project completion date for validity. If the completion date is past the due date, the Project Manager must take corrective action to keep the project schedule and cost in control. The corrective action could involve expediting or taking special steps to ensure that an activity is completed on time or with the least possible delay. Activities on the critical path are usually the target for expediting and may result in a change request that could lead to rebaselining of the project.

Approved changes to the start and finish dates resulting from a change in scope or other constraints must be documented in the PMIP and distributed to the appropriate stakeholders. The causes of variances, reasons for taking corrective action, and other types of lessons learned must be documented in accordance with the change control plan in the PMIP.

1.5.4.3 Risk Management

All projects have both predictable and unpredictable risks associated with them. Therefore, a plan must be in place to manage these risk events, if and when they do occur. This section describes the process of risk management that project managers must adopt.

1.5.4.3.1 Identify and Plan for Anticipated Risks

Certain risk areas are anticipated during the original planning process, and preventive and contingent actions are built into the risk management plan.

Preventive actions are fed back into the project plan and schedule as additional activities. In contrast, contingent actions are triggered by actual risk events and are designed to mitigate the negative impact on project objectives as soon as the risk has materialized. The Project Manager and the project team must:

- Identify the occurrence of an actual risk event that is planned for in the risk management plan.
- Decide if the planned contingency action is still appropriate and modify as needed.
- Communicate the occurrence of the risk event and planned action to affected stakeholders.
- Take the contingent action and monitor the results.
- Assign ownership for all risk-related actions.

1.5.4.3.2 Identify and Plan for Unanticipated Risks

Many risks cannot be anticipated, due to unforeseen circumstances and must be understood and planned for once they are identified. Newly identified risk areas (both opportunities and threats) are quantified and responses developed.

For example, a contractor may be having trouble meeting the schedule for deliverables as originally planned. Actions could be planned to proactively prevent the contractor from falling behind, such as providing the contractor with additional resources. Other actions can be planned for once it is clear that the contractor is not going to meet the schedule, such as terminating the contract and hiring a different contractor to complete the work. Therefore, the Project Manager and the project team must:

- Identify additional sources of risk to the project that were not planned for in the original risk management plan.
- Estimate the likelihood of occurrence and potential impact of occurrence of the risk to understand its importance to the project.
- Define appropriate preventive and contingent actions to avoid or mitigate the impact of the risk area.
- Assign ownership for all risk-related actions.

1.5.4.3.3 Review Response Plans with Stakeholders

Stakeholders are immediately apprised of newly identified risks as soon as adequate information is available. When risks have a higher likelihood of occurrence or their impact is potentially severe, the IESLT, and possibly the customer, should be actively involved in planning mitigating actions. Consequently, the Project Manager and the project team must:

a) Determine the needed level of involvement of the IESLT and/or customer in risk quantification and planning.

b) Inform stakeholders of any newly identified risks and response plans.

c) Involve the IESLT and/or customer in risk quantification and planning to the extent needed.

1.5.4.3.4 Document Risk Responses and Update Plans

All actions taken in response to risk areas are documented as part of the project information. Risk Radar or any other suitable risk management software may be used as a tool to implement the risk management function. Preventive and contingent actions planned for newly identified risk areas are used to update the risk management plan to keep it current. These actions are included as new activities in the project schedule.

Consequently, the Project Manager and the project team:

- Document all actions taken in response to anticipated risks, along with the results of such actions, and include as part of the project archive.
- Define the activities required as preventive actions planned for newly identified risks.
- Identify activity dependencies and sequencing of preventative actions.
- Estimate the durations of preventive actions.
- Estimate any additional resource requirements and cost impacts of such preventive actions.
- Update the project schedule and related documents with estimates from all preventive actions.
- Update the risk management plan with preventive and contingency actions.

1.5.4.3.5 Take Preventive Actions

Since preventive actions are taken proactively to avert the occurrence of the actual risk events, they are executed according to the updated project schedule like any other planned activities. Therefore, the Project Manager and the project team:

- Review the updated project schedule with the team and ensures activity owners are defined for all preventive actions.
- Execute preventive actions.

- Report progress on all preventive actions to all project stakeholders.

1.5.4.4 Communication

The IES Managing Director coordinates and communicates accurate internal and external information to all levels of the organization in a timely and effective manner. Information is disseminated to all levels of the IES organization through staff meetings, memos, one-on-one contact, or emails. As the chair of all organizational level reviews, the IES Managing Director has a full understanding of the program status. The availability of the electronic enterprise program schedule on an enterprise tool keeps all project personnel and management informed of current project status with minimal effort.

DM and SM coordinate projects within their domains with the Project Managers or Leads. The ultimate responsibility of the Project Managers is to coordinate the project team effort judiciously by managing the assigned resources and assuring effective communications within the project. He/she provides performance status to his/her SM and resolves all issues within the project. If a PM has a difficult problem that cannot be resolved within the team, he/she will inform the SM of the problem who will either resolve the problem or coordinate with other peers and the DM to resolve the problem.

Project information is mostly communicated through meetings, as discussed in section 1.5.4.1.1. The requirement for all team members to participate in status meetings in person or via teleconference as needed makes project information readily available to all team members. Project Managers are required to provide a weekly status reports to the IES Managing Director. The PM, in turn, decides whether individual status reports will be required from their teams or if the updates provided at the weekly status meeting are adequate.

The monthly program review meeting provides Project Managers the opportunity to brief the IES leadership team on the status of their projects. Management is expected to provide a feed back to the project teams on their performance and reassure them of management support.

Participants at the monthly program review meetings chaired by the IES Managing Director or a designee include: the IES leadership team (DM, Innovation Managers, SM), Project Managers or Leads, PPR&S, and the BDR. The IES leadership team, PPR&S, and the BDR also participate in the quarterly program review meetings chaired by the IES Managing Director or a designee. An individual is designated for each of these meetings and reviews to document the minutes and action items, which are distributed to all team members via e-mail.

Project information is stored in a database with adequate security control to preclude unauthorized access to sensitive project information and to prevent accidental damage to information. Regular data backup is performed (by ACT Database Administrator) to guard against loss of valuable time and resources in case of system failure or accidental damage to data. Details of project data security procedures are described in the PM Access Control

Process. Electronic and hard copy PM information including memos, reports, correspondence, and other project documents are kept by a designated PPR&S.

1.5.4.5 Product Deliveries

The Project Manager reviews the product with the DM and SM when the product has been completed to assure that the product meets the customer's requirements. The criteria for evaluating the product are the requirements defined in the customer agreement/PD. If the product review team (PM, SM, & DM) believes that the product meets the customer's requirements, it is approved for delivery. The DM subsequently delivers the product to the customer with a delivery note. The customer reviews the product to determine whether it meets his/her requirements. If the requirements are met, the customer signs off on the delivery.

1.5.4.6 Change Management

This PM methodology may only be modified in accordance with section 1.4 of this document. The objective is to control any changes to the product scope or requirements, as defined in the service agreement/PD and the process for implementing the project.

Since changes are inevitable and are expected in projects, an overall change control system is developed, agreed, and incorporated into the project agreement/PD. The agreed change control procedure is incorporated into the PMIP. The change control system provides direction for all change control areas, including scope: time, cost, risk, and technical aspects. All key stakeholders, including the project team, the project sponsor, and the customer must agree it to.

The Change Control Board (CCB), made up of the PM, the customer, and the sponsor, is responsible for approving any changes to the original PMIP or the project scope in accordance with the project agreement. Project reviews or status reviews may necessitate changes or a customer may request changes that will impact cost, schedule, or technical aspects of the project. If and when this happens, the Project Manager must coordinate with the SM and request a change in writing explaining the type of change and need for the request. The IES LT, which functions as the CCB, will schedule a meeting to review and consider the request. Depending on the magnitude of change and the impact, the project may be approved for re-baselining if appropriate.

All CM items must be documented in the appropriate section of the PMIP. Approved changes to scheduled delivery dates resulting from scope change, project reviews, or any other constraints are documented in the PMIP and distributed to appropriate stakeholders. The causes of variances as well as reasons for taking corrective actions and other types of lessons learned are also documented. Apart from version control, all processes and plans have revision history section to track document changes.

1.5.5 Project Closing

At the end of a project or a project phase or if the project is terminated for other reasons, final results are fully documented along with the verification and acceptance of the product by the customer. Lessons learned are consequently documented to include causes of variances, reasons for corrective actions selected, and other lessons learned. The project database, schedule, and resource allocation is updated by the PPR&S. The BDR follows-up the product delivery with a customer satisfaction survey and a report containing recommendations to the IES LT.

1.5.5.1 Project Documentation

All project documents created during its life cycle, including those related to the product and the progress of the project itself, are verified and archived for future use. The Project Manager and team members:

- Collect all project measurement documents generated to record and analyze the project processes, including performance reports and schedule revisions.
- Collect all product documents generated to describe the product of the project, including specifications, test results, and problem trouble reports
- Review all documents to verify the completeness and accuracy of project records.
- Review documents to ensure they reflect the latest or final specifications and revisions.
- Archive project records for future use

1.5.5.2 Post-Implementation Review

To learn what went well (and are replicated) and what should be improved upon, the PPR&S performs a post implementation review. Consequently, corrective actions are planned to prevent similar project problems from recurring. The IES PM practices will continuously improve through a cycle of planning, doing, reflecting, and acting, i.e. “lessons learned”. This requires Project Managers to coordinate with the PPRS to:

- Review and analyze the project records.
- Identify things that went well, things that did not go well, lessons learned, and potential actions.
- Conduct a post implementation review meeting.
- Discuss project successes and what should be replicated in future phases or projects.

- Discuss project problems and what can be done to prevent reoccurrence.
- Assign ownership for implementing corrective actions.
- Review post implementation review outcome with the customer, if necessary.
- Prepare a post implementation review report and distribute it to all stakeholders.
- Include the report as part of the project records

1.5.5.3 Document the Final Acceptance of the Product

Acceptance of the product by the customer is documented and made part of the project records. In final documentation the Project Manager and team members will coordinate with the SM to:

- Close all outstanding issues and actions, if any that may have made final acceptance conditional.
- Prepare the acceptance letter and request approval from the customer.
- Distribute copies of the product acceptance to those affected and include as part of the project records.

1.5.5.4 Exit Interviews

To capture the experiences of all project participants, exit interviews are conducted before disbanding the team. Individual project team members are interviewed to collect information on such items as:

1. Individual technical and team management experiences.
2. Training opportunities or lack of and impacts.
3. Things learned – went well and did not go so well.
4. Recommendations for future similar projects.

APPENDICES

Please refer to the IES PM Process Forms and Templates for all referenced appendices or visit the ACT PM web site for standard forms and templates.